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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,754	02/28/2002	Roger W. Whatmore	112113	3781

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EXAMINER	
ALANKO, ANITA KAREN	
ART UNIT	PAPER NUMBER
1765	

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/069,754	WHATMORE ET AL.	
	Examiner	Art Unit	
	Anita K Alanko	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/31/03 amdt*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/29/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the step of separation must be shown; i.e., the step of aligning the BARs of the first wafer with the wells of the second wafer and then separating individual filers (claim 1); and the step of aligning FBAR filters (e.g., six FBARs as in paragraph [0026]) with wells and separation into individual filters (claim 2) must be shown or the features canceled from the claims. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 10-11 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tomita et al (US 5,666,706).

Tomita discloses a method and a filter made by the method comprising:

providing a first wafer 11 bearing a plurality of bulk acoustic resonators 13 (Fig.2d);

providing a second wafer 16 having a plurality of wells 17;

bonding the first and second wafer to each other to form a composite wafer in which the BARs of the first wafer are aligned with the wells of the second wafer (col.5, lines 61-64); and

separating individual filters (Fig.2f; col.6, lines 16-19).

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 3-5, 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ella (US 6,081,171) in view of Kurle et al (US 6,106,735).

The rejection from Paper No.5 (mailed 10/3/03) is repeated here.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ella (US 6,081,171) in view of Kurle et al (US 6,106,735) and Sparks et al (US 6,062,461).

The rejection from Paper No.5 (mailed 10/3/03) is repeated here.

Claims 1, 3-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kurtz et al (US 5,891,751), Lakdawala et al (1998 IEEE) and Sparks et al (US 6,062,461).

Kurtz discloses a method for hermetically packaging devices comprising

providing a first wafer 28 bearing a plurality of devices (piezoresistors) 21-24 (col.4, lines 23-30, Fig.4),

providing a second wafer 40 having a plurality of wells 49 ("cut-out" in "cover wafer" col.6, line 4),

bonding the fist and second wafers to each other to form a composite wafer (Fig.6A-6B; col.6, lines 51+), and

separating individual devices (along dicing lines 57; col.6, lines 18-19).

Kurtz does not disclose that the devices are bulk acoustic resonators.

Lakdawala teaches that bulk acoustic resonators such as FBARs are useful devices. The FBARs are fabricated on a diaphragm in a silicon substrate (Fig.1), which is the same structure in Kurtz that is packaged. Lakdawala does not disclose how the final device is packaged for use. Sparks teaches that a wide variety of devices including piezoresistors (as in Kurtz) or piezoelectric devices or SAW devices (as in Lakdawala) are known to be packaged hermetically, which improves the performance of the device. It would have been obvious to one with ordinary skill in the art to package the FBARS hermetically because Sparks teaches that piezoelectric devices or SAW devices are useful if packaged hermetically in the final product.

Kurtz discloses a useful method for packaging devices to protect the devices from the environment (col.1, lines 10-32).

It would have been obvious to one with ordinary skill in the art to package the FBARs or SBARs as taught by modified Lakdawala in the manner taught by Kurtz in order to form final products that are protected from the environment, which in turn prolongs the life of the final product.

As to claim 2, Kurtz does not disclose how the wells are formed.

Sparks teaches that when forming a hermetic seal by bonding a first wafer 10 with electrical components 14 to a second wafer 12 with wells 16, that the wells can be formed by etching (col.5, lines 1-2). It would have been obvious to one with ordinary skill in the art to use etching to form the wells in the modified method of Kurtz because Sparks teaches that etching is a useful technique for forming wells.

As to claims 3-4, it would have been obvious to one with ordinary skill in the art to make contacts as cited in the modified method of Kurtz in order to make the final device functional and because contacts and wiring are a conventional method of making electrical contacts.

As to claim 5, Kurtz discloses a third wafer 44 bonded to the first wafer on that face remote from the second wafer.

As to claim 6, Kurtz discloses bonding under vacuum (col.7, lines 57+).

As to claim 7, Kurtz discloses bonding with silicon containing pyrex (col.5, lines 36-37), for which it would have been obvious to use anodic bonding with borosilicate in the modified method of Kurtz because it is a functionally equivalent or conventional bonding process.

As to claim 8, Kurtz discloses bonding with glass and heat and pressure (col.7, line 48-col.8, line 7).

As to claim 9, Kurtz discloses bonding with a solder glass frit (col.6, lines 26-31). However, it would have been obvious to use a metal or alloy and bonding by combination of heat and pressure in the modified method of Kurtz because it is a functionally equivalent or conventional bonding process.

As to claims 10-14, Lakdawala discloses to form FBARs or SBARs (Fig.1).

Response to Arguments

Applicant's arguments filed 12/31/03 have been fully considered but they are not persuasive. Applicant argues that it would not have been obvious to combine Kurle with Ella. The motivation to combine is that Kurle teaches a useful hermetic sealing technique, as is desired in Ella, to prevent contamination of the devices. Applicant also argues about mass loads. This is not persuasive since cavities are needed for the acoustic devices to work.

As to the Ella in view of Kurle and Sparks rejection, applicant argues that the combination of references do not teach alignment or separation. However, the references teach alignment in order to form a functional device and Kurle teaches separation, as discussed in the rejection. Applicant argues that Sparks does not disclose BARs or FBARs. However, Sparks does teach such devices as broadly cited (BAW devices and piezoelectric devices, col.6, line 9-18). Further, Sparks is not relied upon to teach the particulars of the device since the primary reference teaches that. Applicant also argues that Sparks does not teach separation, however, Sparks is not relied upon to teach this step, Kurle teaches it.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kong et al (5448014), JP 06-006175 and Curran (US 3,453,458) appear to be 102 references. Allen et al (US 5,771, 556) and Sawin (US 6,182,342 B1) are cited for their discussions of using a supporting substrate, separating, and packaging.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K Alanko whose telephone number is 571-272-1458. The examiner can normally be reached on Mon,Tues & Fri: 8:30 am-5 pm; Wed&Thurs:10 am-2 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anita K. Alanko

Anita K Alanko
Primary Examiner
Art Unit 1765